# 2003 Water Quality Report

2002 Data

High quality drinking water for 700,000 people every day.

City of Norfolk
Department of Utilities


Department of Utilities
P.O. Box 1080
Norfolk, VA 23510-1080


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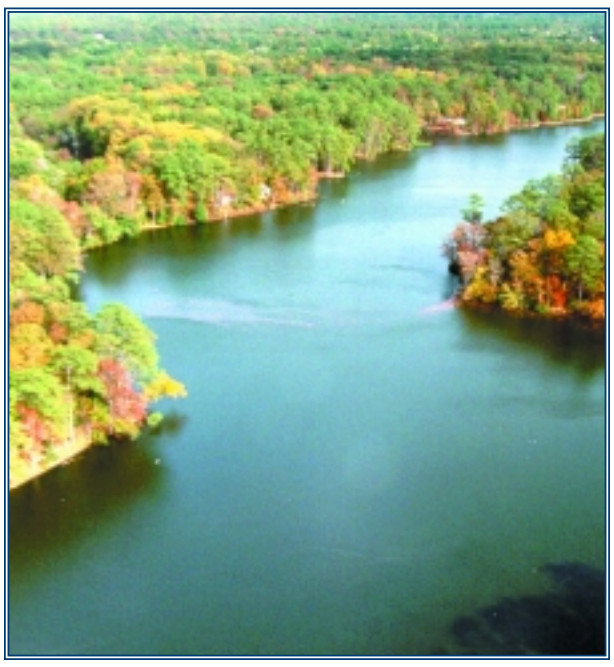
## Why does water need to be treated?

"Natural" does not always mean "pure". As water flows over the land on its way to our lakes, it dissolves naturally-occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants such as viruses and bacteria, which may come from agricultural operations and wildlife living in the watershed
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, or farming
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes, and can come from gas stations, urban stormwater runoff, and septic systems

In addition to these contaminants, all lakes and streams contain algae, which are microscopic plants that can cause taste and odor in drinking water. We do our best to keep most of these contaminants out of our lakes; then our treatment plants make sure that the water delivered to your home meets all government standards and is clean and safe for you to drink.



## About this report

This is Norfolk's annual Consumer Confidence Report on drinking water. The following pages list the substances found in Norfolk's drinking water from January 2002 through December 2002. The amount of each substance found in the water and the maximum level allowed by law are also listed. The Norfolk Department of Utilities sends you an updated report every year. For more frequent water quality information, visit our website at

www.norfolk.gov/utilities
or call
Vernon Land, Water Quality Manager, 441-5678.

To participate in decisions affecting your drinking water quality, you may attend Norfolk City Council meetings. For times and agendas, call the City Clerk's office at 664-4253.

For more information about your drinking water or the Department of Utilities, call 664-6701 (Utilities Administrative Office).

*Reservoir water is tested before it goes to the water treatment plants.*

## Source Water Assessment

In 2001 the Hampton Roads Planning District Commission conducted a study on all of the water sources in the area, including Norfolk's, to determine the susceptibility of reservoirs, rivers, and wells to contamination. The report determined that reservoirs, in general, have the possibility of being contaminated by accidental discharge of waste materials. However, the two City of Norfolk water treatment plants test and treat the reservoir water to meet the Federal government's high standards for drinking water.

Wells were determined to be fairly safe from contamination. This report is available by contacting the Norfolk Department of Utilities.

## What is in Norfolk's drinking water?

To ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) has developed regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) has established similar but less stringent regulations for bottled water.

All drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of these contaminants does not indicate that the water poses a health risk.

However, some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as people undergoing chemotherapy, organ transplant patients, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

*Norfolk's water quality chemists make sure that you have high quality drinking water by testing before, during and after treatment.*

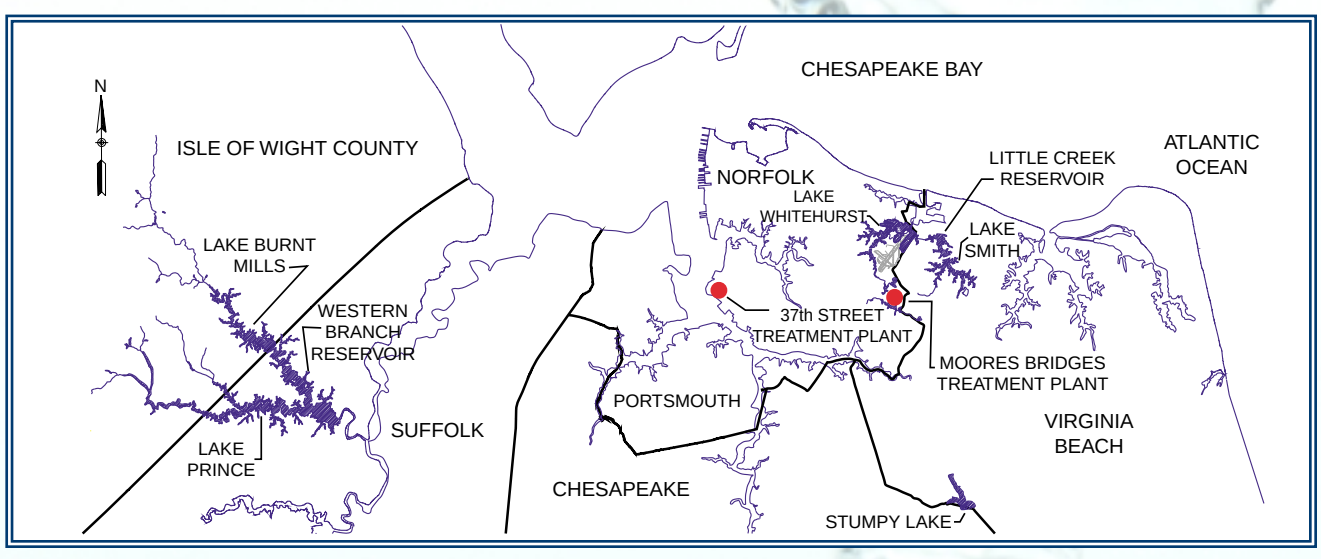
The EPA and Center for Disease Control and Prevention guidelines on reducing the risk of infection by cryptosporidium and other microbial contaminants are available from:

EPA Safe Drinking Water Hotline, (800) 426-4791.

## Where does Norfolk's drinking water come from?

Norfolk's drinking water comes from various water sources:

- Western Branch Reservoir
- Lake Prince
- Lake Burnt Mills
- Lake Wright
- Lake Whitehurst
- Little Creek Reservoir
- Lake Smith
- Lake Lawson
- Lake Gaston
- Nottoway and Blackwater Rivers
- Four deep wells



## Table Key

**ppm** - One part per million; the equivalent of 1 minute in 2 years

**ppb** - One part per billion; the equivalent of 1 minute in 2,000 years

**pCi/L** - Picocuries per liter (a measure of radioactivity)

**NTU** - Nephelometric Turbidity Unit (a measure of very small particulate matter in drinking water)

**>** - Greater than

**ND** - Not detected in the water

## Table Definitions

**SUBSTANCE** - The compounds detected in Norfolk's drinking water during calendar year 2002. All amounts detected are below allowed levels. Not listed are the hundreds of other compounds for which we tested that were not detected at all.

**LIKELY SOURCE** - Where the substance could come from.

**AVG. LEVEL** - Average amount of substance found in the water during the year.

**MAXIMUM CONTAMINANT LEVEL GOAL (MCLG)** - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety set by EPA.

**MAXIMUM CONTAMINANT LEVEL (MCL)** - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible, using the best available treatment technology.

**TREATMENT TECHNIQUE (TT)** - A required process intended to reduce the level of a contaminant in drinking water.

**ACTION LEVEL (AL)** - The concentration of a contaminant that, if exceeded, triggers treatment or other water system requirements.

## Monitoring Violation

Drinking water regulations require manual samples be taken when automatic monitoring equipment fails. The 37th Street Water Treatment Plant did not collect the required number of turbidity samples on two occasions in March and April 2002. This is termed a "monitoring violation". ***At no time was there any danger to public health.***

To keep this from happening in the future Norfolk has modified its standard operating procedures to address these issues and has enhanced the online computer systems to detect monitoring problems.

Turbidity is the cloudiness of the water. Turbidity has no health effects, but it is an indicator of water quality and the effectiveness of our treatment process. Turbidity can interfere with disinfection, provide a medium for microbial growth and may indicate the presence of bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

**People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. The symptoms above can be caused by something other than organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice.**

# The Virginia Department of Health and the City of Norfolk Department of Public Health reviewed this water quality report.

## Regulated Substances

These substances are regulated by the EPA. That means we are required to test for them in your drinking water. They cannot be above a certain level referred to as the MCL (maximum contaminant level).

| Substance | Likely Source | Range | Average Level | Highest Level | MCL | MCLG | Unit | Meets EPA Stds. |
|---|---|---|---|---|---|---|---|---|
| 2,4-D | Row-crop herbicide runoff | ND – 0.1 | ND | 0.1 | 70 | 70 | ppb | ✔ |
| Barium | Erosion of natural deposits | 14 – 24 | 20 | 24 | 2000 | 2000 | ppb | ✔ |
| Chlorine (Total) | Disinfectant added to kill bacteria | 2.4 – 3.5 | 2.75 | 3.5 | 4 | 4 | ppm | ✔ |
| Dalapon | Right-of-way herbicide runoff | ND – 1.6 | ND | 1.6 | 200 | 200 | ppb | ✔ |
| Fluoride | Added for the prevention of tooth decay | 0.16 – 1.39 | 0.90 | 1.09* | 4 | 4 | ppm | ✔ |
| Gross Alpha Activity | Erosion of natural deposits | 0.3 – 0.4 | 0.4 | 0.4 | 15 | 0 | pCi/L | ✔ |
| Gross Beta Activity | Erosion of natural deposits | 3.4 – 5 | 4.2 | 5 | 50 | 0 | pCi/L | ✔ |
| Total Haloacetic Acids (HAAs) | By product of drinking water chlorination | 25 – 68 | 43 | 48** | 60 | N/A | ppb | ✔ |
| Nitrate as Nitrogen | Erosion of natural deposits, runoff | 0.04 – 0.13 | 0.07 | 0.13 | 10 | 10 | ppm | ✔ |
| Radium 226/228 | Erosion of natural eposits | 0.2 – 0.5 | 0.35 | 0.5 | 5 | 0 | pCi/L | ✔ |
| Total Trihalomethanes (TTHMs) | By-product of drinking water chlorination | 23 – 98 | 46 | 48** | 80 | N/A | ppb | ✔ |

* This number is the highest monthly value of compliance samples for the calendar year
** This number is the highest quarterly running average of compliance samples for the calendar year

## Turbidity

Turbidity is a measure of the cloudiness of water. Turbidity, by itself, is not harmful, but it can interfere with the disinfection of drinking water.

| Substance | Likely Source | Lowest Monthly Percentage of Samples Meeting the Limit | Highest Level (NTU's) | TT | MCLG | Unit | Meets EPA Stds. |
|---|---|---|---|---|---|---|---|
| Turbidity | Soil Runoff | 99% | 1.5 | <95% | NA | NTU | ✔ |

## Microbiological Contaminants

Total Coliform bacteria are naturally present in the environment. They are used as an indicator that other, potentially harmful bacteria may be present.

| Substance | Likely Source | No. of Samples Indicating Presence of Bacteria | Highest Monthly Percentage of Positive Samples | Month of Sampling | MCL | MCLG | Meets EPA Stds. |
|---|---|---|---|---|---|---|---|
| Total Coliform Bacteria | Naturally Present in the Environment | 2 | 1.3% | Jul, Sep | >5% of all Samples Positive for Total Coliform | 0 | ✔ |

## Lead and Copper in Customers' Homes

We monitor for both lead and copper in fifty of our customers' homes. No lead was detected at the monitoring level*. Copper is typically found in very low levels in homes and comes from the corrosion of copper plumbing and brass fixtures. Norfolk is on a reduced monitoring schedule due to extremely low lead levels.
This data is from our 2002 sampling

| Substance | Likely Source | Result At the 90th Percentile | Number of Homes Exceeding Action Level | Action Level | Unit | MCLG | Meets EPA Stds. |
|---|---|---|---|---|---|---|---|
| Copper | Corrosion of Household Plumbing Systems | 0.207 | 0 | 1.3 | ppm | 1.3 | ✔ |

* - lead and copper compliance is measured at the 90th percentile of all samples taken.

## ICR Data (From 1998)

These substances were monitored as part of a federal law called the Information Collection Rule (ICR). The ICR required all water systems serving greater than 100,000 people to monitor for a list of substances in their drinking water. These results will be used to set new drinking water regulations for the future.

| Substance | Likely Source | Range | Avg. Level | Highest Level | MCL | Unit |
|---|---|---|---|---|---|---|
| Chloral Hydrate | By-product from the disinfection of drinking water | 2.3 - 21 | 8.4 | 21 | None | ppb |
| Chlorate | By-product from the disinfection of drinking water | 0.03 - 0.30 | 0.14 | 0.30 | None | ppm |
| Disinfectant Residual | Added to drinking water to kill germs | 0.1 - 2.7 | 1.6 | 2.7 | None | ppm |
| Haloacetic Acids(5) | By-product from the disinfection of drinking water | 25 - 100 | 51 | 100 | None | ppb |
| Haloacetonitriles | By-product from the disinfection of drinking water | 2.9 - 9.8 | 5.8 | 9.8 | None | ppb |
| Haloketones | By-product from the disinfection of drinking water | 2.5 - 9.4 | 5.9 | 9.4 | None | ppb |
| Total Organic Carbon | Natural component of lakes and streams | 2.2 - 3.1 | 2.6 | 3.1 | None | ppm |
| Total Organic Halide | By-product from the disinfection of drinking water | 103 - 366 | 216 | 366 | None | ppb |

## Unregulated Substances

These substances are not regulated by the EPA but must be monitored. By monitoring for these substances, the EPA gathers information about their occurrence in drinking water, and sets limits for them if they are harmful.

| Substance | Likely Source | Range | Avg. Level | Highest Level | MCL | Unit |
|---|---|---|---|---|---|---|
| Bromodichloromethane | By-product from the disinfection of drinking water | 8 - 14 | 12 | 14 | None | ppb |
| Chloroform | By-product from the disinfection of drinking water | 17 - 55 | 33 | 55 | None | ppb |
| Dibromochloromethane | By-product from the disinfection of drinking water | 2 - 3 | 2 | 3 | None | ppb |
| Bromochloroacetic Acid | By-product from the disinfection of drinking water | 3 - 4 | 3 | 4 | None | ppb |
| Dichloroacetic Acid | By-product from the disinfection of drinking water | 17 - 19 | 18 | 19 | None | ppb |
| Monochloroacetic Acid | By-product from the disinfection of drinking water | 3 | 3 | 3 | None | ppb |
| Trichloroacetic Acid | By-product from the disinfection of drinking water | 21 - 24 | 22 | 24 | None | ppb |
| Chloromethane | Degreasing solvent | .5 | .5 | .5 | None | ppb |
| Dibromomethane | Degreasing solvent | .5 | .5 | .5 | None | ppb |
| Sulfate | Occurs naturally in the environment, also comes from the addition of treatment chemicals at the water treatment plant | 24 - 35 | 28 | 35 | None | ppm |
| Radon 222 | Erosion of natural deposits | 11 | 11 | 11 | None | pCi/L |

## Cryptosporidium and Giardia

These are microscopic one-celled organisms that get into lakes and streams through runoff of infected animal wastes. If ingested, contaminants such as Cryptosporidium and Giardia can cause serious illness in susceptible people. Our source water is routinely tested for Cryptosporidium and Giardia. While minute traces of the organisms have been found in the untreated water on rare occasions, Cryptosporidium and Giardia have never been detected in our treated water. Disinfection procedures performed at the water treatment plant and throughout the distribution system greatly reduce the threat of illness from Cryptosporidium, Giardia and other microbiological contaminants.